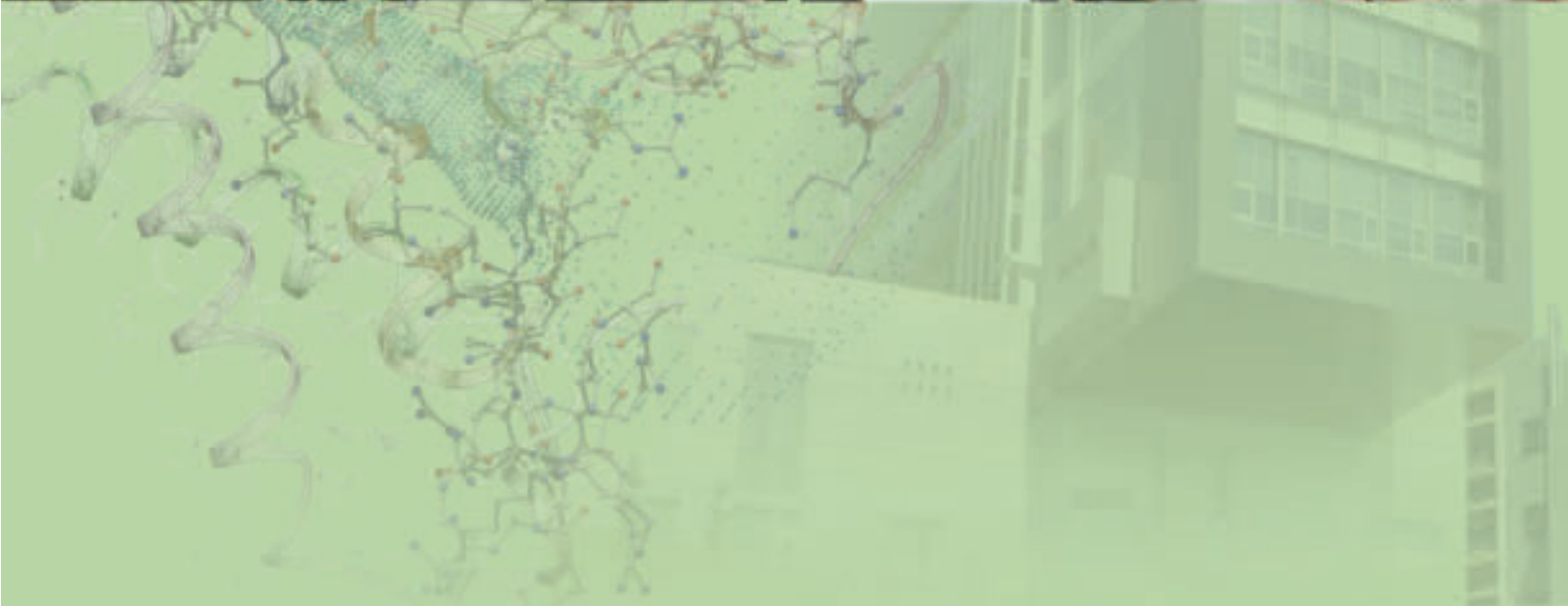


# PartnerSmart

with

Lawrence Berkeley National Laboratory



## Technology Transfer

*From Berkeley Lab to the Marketplace*



# Partnering with



## Lawrence Berkeley National Laboratory



Dr. Paul Alivisatos  
Director, Berkeley Lab

Lawrence Berkeley National Laboratory, also known as Berkeley Lab, is located in the hills above the University of California, Berkeley campus, adjacent to the San Francisco Bay. It is funded by the Department of Energy with an annual budget of over \$700 million and has been a leader in science and engineering research for over 75 years.

### Science at Berkeley Lab

Berkeley Lab conducts non-classified research across a wide range of scientific disciplines with key efforts in

- Biosciences
- Advanced Materials
- Nanoscience
- Climate and Energy Analysis
- Biofuels, Solar, and Energy Efficiency
- Medical Imaging
- Fuel Cells and Batteries
- Software and Information Technology

## Technology Transfer at Berkeley Lab

Our research produces innovative technologies with commercial value. **The Department of Technology Transfer and Intellectual Property Management** moves technologies from the Lab to the marketplace to benefit society and the U. S. economy. We accomplish this by developing and managing an array of partnerships with the private sector including licensing, collaborative research, and sponsored research.

We license cutting-edge technologies to companies, including start-ups, that have the financial, R & D, manufacturing, marketing, and managerial capabilities to successfully commercialize Lab inventions. In addition, we ensure that inventions receive proper intellectual property protection, and we serve as the Lab resource on industry relations.

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*Lawrence Berkeley National Lab has been the ideal partner in moving our ultra-thin film nanocrystal solar cell technology speedily from lab to product fabrication. LBNL researchers' expertise and guidance enabled us to greatly reduce our development costs and ramp-up time. I'd encourage other entrepreneurs to work with LBNL, and would welcome the chance to do so again.*

—Damoder Reddy, Founder and Former CEO, Solexant Corp.

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# Berkeley Lab



## Many Ways to Work with Berkeley Lab

The Technology Transfer Department serves as a focal point to foster productive relationships between the Lab and the private sector. There are many ways for industry to work with Berkeley Lab.

### License intellectual property

Through technology licensing, industry helps translate new discoveries into commercially viable products and processes.

### Sponsor research

A company may sponsor research at Berkeley Lab when capabilities and interests match. This provides industry with an excellent way to leverage the Lab's best research capabilities.

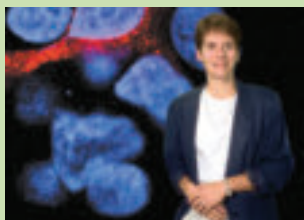
### Access eight state-of-the-art facilities

([www.lbl.gov](http://www.lbl.gov))

Our facilities provide state-of-the-art instruments, techniques, and scientific staff to assist with advanced studies, and they are available for use by both industry and academic institutions.

1. Advanced Light Source (ALS)
2. Advanced Biofuels Process Demonstration Unit (ABPDU)
3. Buildings User Test Bed Facility (UTBF) for Low-energy Integrated Building Systems
4. Energy Sciences Network (ESnet)
5. Joint Genome Institute (JGI)
6. The Molecular Foundry (a nanostructure user facility)
7. National Energy Research Scientific Computing Center (NERSC)
8. National Center for Electron Microscopy (NCEM)

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*There is nothing more satisfying than seeing the knowledge we produce in our basic research applied in a manner that impacts society; [it] is a key step in the process of economic growth as well.*

—Carolyn Bertozzi, LBNL Faculty Senior Scientist; T.Z. and Irmgard Chu Distinguished Professor of Chemistry and Molecular and Cell Biology, UC Berkeley

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# Frequently Asked Questions

## How can I find out about technologies available for licensing?

- Visit our index of available technologies at: <http://www.lbl.gov/tt/techs/index.html>
- Sign up for our customized new technology email alerts at: <http://www.lbl.gov/tt>
- Write us at [TTD@lbl.gov](mailto:TTD@lbl.gov) or call 510-486-6467

Berkeley Lab broadly disseminates information about licensing opportunities via the Web, scientific journals, and promotional mailings sent to both corporate executives and the media.

## What if I am interested in an area of research, but there is no particular technology listed?

We will try to match you with a scientist doing work in your area of interest.

## How does Berkeley Lab choose a licensee?

Berkeley Lab seeks licensees who are most able to bring a technology to market. The criteria we use to qualify a licensee are

- R&D capabilities
- Financial resources
- Management commitment
- Experience in relevant markets

## How long does it take Berkeley Lab to negotiate a license?

Every license is different. The time depends upon the complexity of the transaction. It generally takes a few months.

## How much does a license cost?

Our licensing fee structure is in line with that of

other academic institutions. The cost of a license is based on:

- The market value of the technology
- Common licensing practices in the relevant industrial sector
- Additional development costs involved in bringing the technology to market
- The scope of the field of use or geographic region

## The financial terms include:

- An issue fee, which is nonrefundable and due upon execution of the agreement
- A running royalty fee, which is most commonly based on a percentage of sales
- A minimum annual royalty fee
- Other financial terms appropriate to the technology and market, such as milestone payments

We endeavor to find win-win solutions and are experienced in working with small businesses and start-ups. We sometimes accept equity as part of a licensee's financial commitment.

## What other important requirements are in Berkeley Lab licenses?

We are committed to ensuring that our licensed technologies are commercialized so that the public ultimately benefits. Berkeley Lab licensees must meet mutually agreed upon performance requirements that reflect diligent progress towards commercialization.

## What is the typical length of a license?

Berkeley Lab licenses usually run for the life of the patent, although other terms are available.



# FAQs

## Can I get an exclusive license from Berkeley Lab?

Licenses may be exclusive, exclusive for a particular field of use or geographic region, or non-exclusive.

In all Berkeley Lab agreements, the U.S. government is granted a fully paid-up, non-transferable, non-exclusive license to use the invention for government purposes only, as is the case with other federally funded inventions.

## Will Berkeley Lab allow me to sublicense?

Generally, yes, if you have an exclusive license.

## Do I have to manufacture in the U.S.?

Under an exclusive license, the technology must be substantially manufactured in the U.S. for sales to the U.S. market.

## Will Berkeley Lab assign all patent rights to my company?

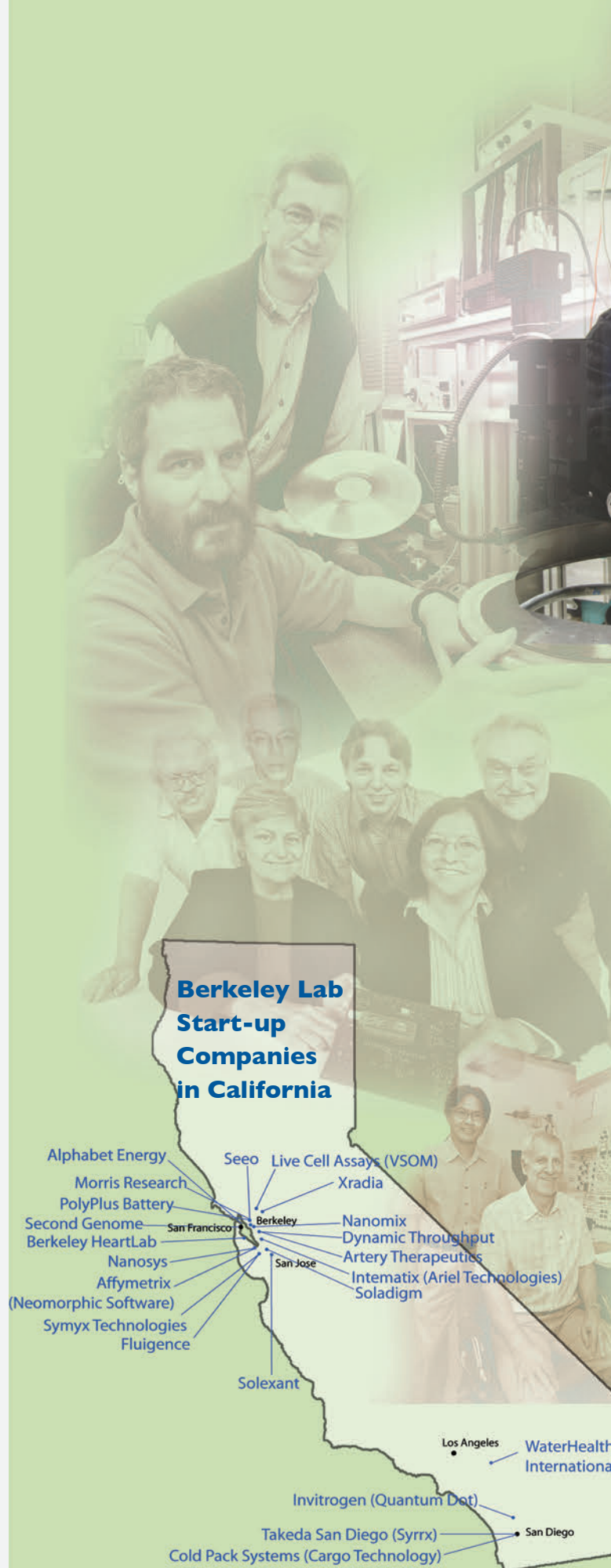
No, Berkeley Lab retains patent ownership of its technologies. Your company will be granted a license to use the technology.

## Are Berkeley Lab technologies ready for immediate commercialization?

It usually takes at least a year, and often longer, to develop the technology into a commercial product.

## Are licenses available to non-U.S. companies?

Yes, although as a federally-funded facility, Berkeley Lab has a preference for U.S. companies.



# A Track Record of



## Selected Licensed Technologies

**PHENIX** is automated macromolecular crystallography software that determines protein structure with increased throughput and efficiency. It is licensed and co-developed by Bristol Myers Squibb, Novartis, Wyeth Research, Glaxo-SmithKline, Johnson & Johnson, among others.

**EnergyPlus** is an energy simulation software program that models heating, cooling, lighting, ventilation, and other energy flows within a building. Over 100,000 architects, engineers, and others have downloaded the software, and over 50 companies have entered into commercial distribution licenses.

**Ultra-Clean Low Swirl Combustion** is a combustion method that emits very low levels of nitrogen oxide pollutants. Maxon Corporation has commercialized burners for industrial heating and drying based on this technology.

**Ion Mobility Analysis** is a low cost, rapid method for early detection of cardiovascular disease risk. It is licensed to Quest Diagnostics.

**Electromagnetic Geological Mapping** software minimizes the risk in finding offshore fossil fuels by converting signals from electromagnetic imaging of hydrocarbon reservoirs into 3-D maps. The software has been licensed to multiple companies including ExxonMobil, Shell International, ConocoPhillips, and Chevron Energy.

**Fully-Depleted Charge Coupled Device** was a new CCD technology developed with high quantum efficiency without the need for thinning. It is licensed to Digirad for use in portable gamma cameras for cardiac imaging, offering physicians a compact, patient-friendly design.

“By partnering with Dr. Cheng and Berkeley Lab, we have been able to introduce industry-best technology at a reasonable price while compressing our time to market. Our experiences with LBNL licensing have been very satisfying and profitable while introducing innovative clean-combustion technology to our nation's energy infrastructure.

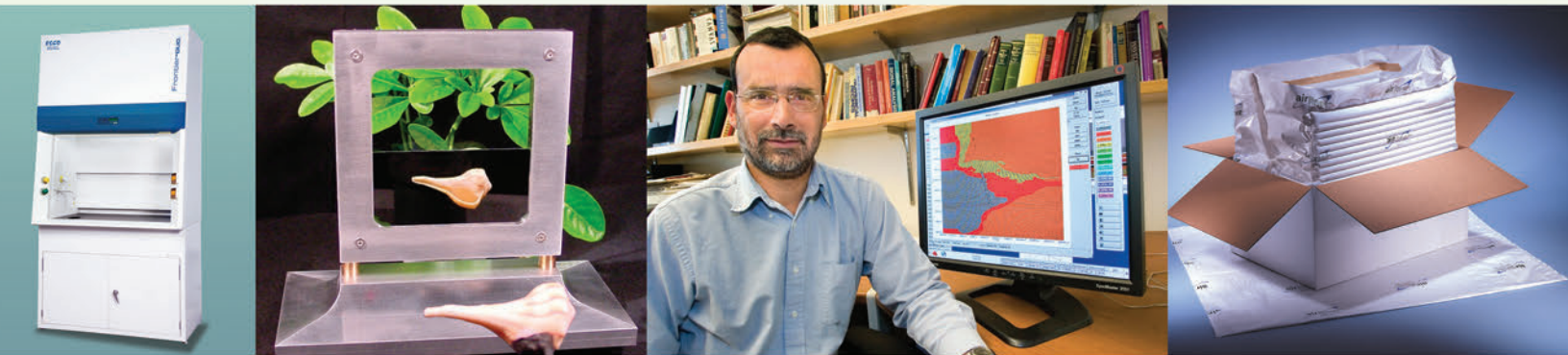
—Jeffrey Rafter, Senior Marketing Manager, Maxon Corporation

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# Success

The Technology Transfer Department is staffed by professionals experienced in managing, marketing, and licensing intellectual property, as well as in patent prosecution. Over the last fifteen years, we have executed over 800 licenses, and over 30 start-up companies have been launched based on technologies developed at the Lab. We work with companies small and large, domestic and foreign, to promote the use of Berkeley Lab inventions to benefit the public.



## Selected Start-ups

**Symyx Technologies** was founded on a combinatorial chemistry technology developed at Berkeley Lab.

**WaterHealth International** delivers clean water to the most remote, underserved communities throughout the world using ultraviolet light disinfection technology.

**Solexant**, a semiconductor nanocrystal-based thin film photovoltaics company, promises to deliver products with increased solar cell efficiency and reduced manufacturing costs.

**RSL Energy** is commercializing full spectrum solar cells that may achieve practical efficiencies far above the state-of-the-art.

**Nanosys** has licensed Berkeley Lab's nanocrystal technology for solar cell and electronics applications. The company is currently developing QDEF™ and Quantum-Rail™ devices, LED backlighting units that improve the color range, brightness and intensity of LED displays in notebook computers, smart phones and other devices.

**Aeroseal** uses an aerosol-based duct sealing system to greatly increase energy efficiency in residential and commercial buildings throughout the country.

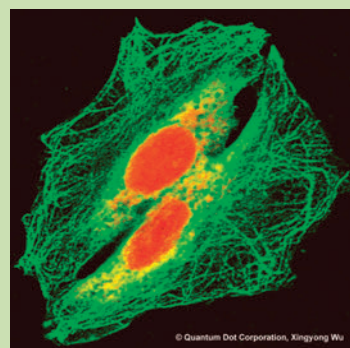
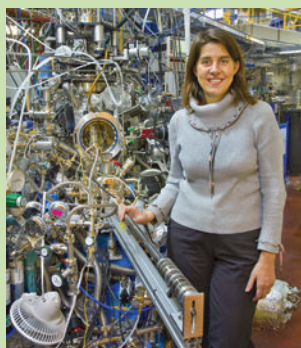
## Tapping Into Talent at UC

**Over 250 Berkeley Lab scientists** have joint faculty appointments at **UC Berkeley** or **UC San Francisco**.

**The Joint BioEnergy Institute (JBEI)** is a partnership between Berkeley Lab, UC Berkeley, UC Davis, the Carnegie Institution for Science, and Sandia and Lawrence Livermore national laboratories to create advanced biofuels from the cellulose in plants.

**The Joint Center for Artificial Photosynthesis (JCAP)** is a partnership led by the California Institute of Technology (Caltech) in partnership with Berkeley Lab, the SLAC National Accelerator Laboratory at Stanford, and the UC campuses at Santa Barbara, Irvine and San Diego to develop solar-fuel technologies modeled off plant photosynthesis.

Berkeley Lab has a collaborative **cancer research program** with **UCSF's Comprehensive Cancer Center**.





# We are ready to talk *with you.*

Contact us at:

Lawrence Berkeley National Laboratory  
One Cyclotron Road, MS 56A-0120  
Berkeley, CA 94720

Telephone: 510-486-6467  
Email: [TTD@lbl.gov](mailto:TTD@lbl.gov)

Sign up to receive our customized new technology alerts at  
<http://www.lbl.gov/tt>

## **Selected licensees and industrial collaborators we've worked with:**

Abbott Laboratories	ConocoPhillips	IBM	Pfizer
Adelphi Technology	CooperVision	Ikerlan	Quest Diagnostics
AltaGen Bioscience	Dakota Technologies	Intel	Raytheon Technical Services
AMD	Digirad	Johnson Controls	Roche
Affymetrix	Dow Chemical	Johnson & Johnson	RoseStreet Labs
Amgen	DuPont	Lockheed Martin	Schlumberger Technology
Anadarko Petroleum	Eli Lilly and Company	MAXON	Seagate Technology
Applied Materials	ExxonMobil	MedImmune	Shell
Battelle	Electric Power Development	Merck & Co.	Shimadzu
Berkeley HeartLab	Fairchild Semiconductor	MKS Instruments	Siemens
Bio-Rad Laboratories	Ford Motor	Microsoft	Sigma-Aldrich
Boeing	Genentech	Mobotec USA	Statoil
Bristol-Myers Squibb	Genzyme	Monsanto	Synamem
Cargill	General Motors	National Semiconductor	Taisei
Cell Signaling Technology	Fi-Foil Company	Novartis	Takeda Pharmaceutical
Cellular Bioengineering	Gilead Sciences	Pathway Diagnostics	Target
Chevron Energy	GlaxoSmithKline	PPG Industries	United Technologies
Chiron	Hewlett-Packard	Praxair	Wells Fargo
Coldpack	Honeywell International	Procter & Gamble	Wyeth-Ayerst Research

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